The Genus Xyletobius on Oahu, with Descriptions of New Species (Coleoptera: Anobiidae)

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The first taxonomic work on the endemic Hawaiian genus *Xyletobius* was contributed by David S. Sharp (Trans. Ent. Soc. London, 1881: 520-522), when he described three species as the basis of the genus, i.e., *marmoratus, oculatus,* and *nigrinis. X. marmoratus* is hereby designated as the genotype. In 1885 (Trans. Dublin Soc., p. 158), Dr. Sharp and Rev. Blackburn described four more species. The third and largest account was submitted by R. C. L. Perkins in 1910 (Fauna Hawaiiensis 3, pp. 585-613), in which he described 45 new species of *Xyletobius.* The last addition to this genus was a single species by Dr. Perkins in 1920 ("PROCEEDINGS" 4:505). Thus in Hawaii there are 53 species, 28 of which have been recorded from Oahu.

Some of the characters used in the following key were taken from Dr. Perkins' grouping of the species.

Key to the Oahu Species of Xyletobius

1. Pronotum tuberculate ..... 2.
   Pronotum not tuberculate ..... 3.
2. Longer than 5 mm.; elytra covered with pale brown pubescence except the sides which are dark brown ..... **walsinghamii** Perkins
   Shorter than 5 mm.; mottled with pale and dark brown pubescence ..... **sylvestrii** Perkins
3. Pronotal outline not laterally convex; nearly a straight line ..... 4.
   Pronotal outline laterally convex ..... 5.
4. Pubescence scanty, dorsal sculpture easily seen; length 3 mm ..... **grimshawi** Perkins
   Pubescence dense, dorsal sculpture obscured; length 4-8 mm ..... **timberlakei** Perkins
5. Elytra with yellow or red spots ..... 6.
   Elytra without yellow or red spots ..... 13.
6. Antennal segments 7-10 at least twice as long as wide and conspicuously longer than the preceding segments ..... 7.
   Antennal segments 7-10 not twice as long as wide and usually not conspicuously longer than the preceding segments ..... 10.
   (Note: this character more pronounced in the male.)
7. Legs black or nearly so ..... 8.
   Legs yellow or red ..... 9.
8. Yellow pubescence only on the elytral spots ..... **beddardi** Perkins
   Yellow pubescence pale and generally distributed on the elytra ..... **ashmeadi** Perkins
9. Elytra with dark golden pubescence throughout; length 2.5 mm ..... **forelli** Perkins
   Elytra with varicolored pubescence ..... **blackburni** Perkins
10. Pronotum with two yellow spots ..... **sharpi** Perkins
    Pronotum without yellow spots ..... 11.
11. Pronotum with a bare medial line ..... **roridus** Perkins
    Pronotum without a bare medial line ..... 12.

12. Pubescence long and woolly ..... **fraternus** Perkins
Pubescence short and straight ..... **simoni** Perkins
13. Without tangential or varicolored pubescence ..... 14.
With tangential or varicolored pubescence or both ..... 16.
14. Robust, black species ..... **aleuritis** Perkins
Elongate, brown species ..... 15.
15. Elytral striae 2 and 5 confluent ..... **gossypii** n.sp.
Elytral striae 4 and 5 confluent ..... **chenopodii** n.sp.
16. Pronotum feebly explanate at the sides; small species ..... 17.
Pronotum conspicuously explanate at the sides; medium size species ..... 21.
17. Pronotum with the anterior margin laterally raised or prominent ..... 18.
Pronotum with the anterior margin not raised, simply rounded ..... 19.
18. Pubescence bright golden on the pronotum in contrast to the copper colored elytra ..... **sykesii** Perkins
Pubescence entirely golden on the dorsum ..... **chryseis** Perkins
19. Black species with long antennae ..... **suboculatus** Perkins
Not black; antennae short ..... 20.
20. Elytral pubescence arranged to give the impression of alternate light and dark longitudinal lines ..... **lineatus** Sharp
Elytral pubescence not arranged to form longitudinal lines; bright golden, robust species ..... **lasiodes** Perkins
21. Pronotum raised and shining on the anterior margin; elytra without transverse bands ..... **proteus** Perkins
Pronotum not raised and shining on the anterior margin; elytra with transverse bands ..... 22.
22. Pubescence dark fuscous, the transverse bands golden ..... **marmoratus** Sharp
Pubescence not fuscous ..... 23.
23. Elytra with brassy pubescence; the dark areas vary in size and contour when viewing the insect at different angles ..... **bidensicola** n.sp.
Elytra with buff pubescence, sometimes reflecting pink; the transverse bands brown ..... **euphorbiae** Perkins

The following species were recorded from Oahu by Dr. Perkins, but are not included in the key for the reasons indicated.

euceras Perkins: Dr. Perkins' discussion of this species leaves some doubt regarding Oahu as its habitat. I have not seen a specimen. (F.H. 3:594.)

euops Perkins: I have not seen this species. (F.H. 3:601.)

cyphus Perkins: This species was described from a single mutilated specimen according to Dr. Perkins. I have not seen a specimen. (F.H. 3:603.)

mundus Perkins: Described from a single specimen. Dr. Perkins considers it possibly a variety of *sykesii*. I have been unable to locate another example. (F.H. 3:608.)

Xyletobius gossypii, new species

Male: Elongate, medium sized, integument brown throughout, covered with an aureous pubescence; dorsum granulose. *Antenna:* Slender, thinly pubescent; third to eleventh segments becoming longer and less serrate from base to apex, except for the ninth and tenth segments which are equal in length; terminal segment filiform, slightly longer than tenth. Several long setae on each segment contrasting with the shorter uniform tomentum. *Head:* Including the eyes, practically as wide as the distance between the frontal angles of the pronotum; granulate, these granules mostly about as wide as the distance between them; densely pubescent; setae longer near the mouthparts; distance between the eyes in front about as wide as the combined width of the eyes. Maxillary palpus slightly emarginate; labial palpus truncate at the apex of the terminal segment; mandibles prominent with a tooth on the inner side just before the acute apex, glab-

rous and piceous apically, unevenly punctate in the basal depression which contains seven or eight long setae; eyes large, sparsely setose. *Pronotum:* From above but little wider than the base of the elytra; unevenly rounded, transverse; front angles 90°, slightly curved inward; hind angles evenly rounded, obtuse; anterior and lateral margins carinate, shining; pubescence arranged to give the impression of deep basal depressions, these depressions actually shallow. *Elytra:* Less granulate than the pronotum; striations deep, narrow, feebly punctured; interstices not convex; third and fourth striae end without joining five-sixths the distance from base to apex; second and fifth striae terminate and unite just behind third and fourth; sixth and seventh striae unite and terminate farther from the apex than the ends of the third and fourth; ninth and tenth striae join near the apex; none of the striae reach the apical margin; humeri obviously but feebly raised. *Abdomen:* Visible sternites truncate at the hind margins, except the first which is convex posteriorly at the middle; distance between the middle and hind coxae less than the length of the first three visible sternites combined. *Legs:* Slender; femora slightly swollen; first tarsal segment of middle and hind legs longer than the three following segments combined, and twice as long as the second segment; tibiae small. Length: 4.2 mm., breadth: 2.0 mm.

Allotype: Abdomen slightly swollen; smaller eyes; two small but obvious tubercles near the posterior margin of the apical sternite. Length: 4.3 mm., breadth: 2.0 mm.

Paratypes: 6 males, length: 3.8-5.1 mm., and 5 females, length: 4.1-5.9 mm.

Type locality: Oahu, Waianae-Nanakuli coast; altitude 25 ft.

Holotype male and allotype in the Bernice P. Bishop Museum. Two paratypes in the collection of the Hawaiian Sugar Planters' Association Experiment Station, and one paratype in the British Museum (Natural History). The remaining paratypes in the collection of the author.

A series of 12 specimens were collected by the author in dead stems of an endemic cotton plant (*Gossypium tomentosum* Nuttall) between December, 1951, and November, 1952, and a single specimen from *Sida* collected by O. H. Swezey, Kaimuki, Oahu, 1923.

X. gossypii bears a strong superficial resemblance to *chenopodii* new species, its closest ally, but the pronotum is less explanate, the abdomen less elongate, and the eyes of the male smaller than those of *chenopodii*. *X. gossypii* is also allied to *aleuritis* Perkins. In Dr. Perkins' key to the species (F.H. 3, p. 585) *aleuritis* is the only species omitted, as he doubted that it really belonged to the genus. *X. aleuritis* is a robust, black species readily distinguished from *gossypii*.

X. gossypii must be considered a rare insect, although it may have been quite common prior to the depletion of the host plant and the introduction of the predaceous ant *Pheidole megacephala* (F.). Even so, where the native cotton occurs in large stands, dead stems in a suitable condition are not plentiful.

Xyletobius chenopodii, new species

Male: Extremely elongate, medium sized, uniformly covered with an aureous pubescence; dorsum granulose; integument fusco-rufous throughout. *Antenna:* Long and slender; segments six to eleven nearly equal in length; the fourth segment two-thirds as long as the sixth; moderately serratæ, more so basally. *Head:* Distinctly granulose; granules evenly distributed, as wide as the distance between them; distance between the eyes distinctly less than the combined width of the eyes; inner mandibular tooth little shorter than the outer apical tooth; posterior portion of mandible shallowly excavated; maxillary and labial palpi testaceous, emarginate at the apices of the terminal segments; terminal segment of the maxillary palpus obtuse on the outer angle, and one-third again as long as the second segment. *Pronotum:* Moderately transverse; front angles feebly excised; slightly wider than the base of the elytra; anterior margin strongly raised, shining, dark fuscous; front angles invisible dorsally, feebly rounded, not termi-

nating in a sharp point, slightly obtuse. *Prosternum:* Tomentum fine, sparse, pale; sclerotization accentuated by sutures darker than the ground color. *Elytra:* Extremely elongate; striae fine but deeply impressed; first stria extends 0.6 mm. past the apex of the scutellum; fourth and fifth striae unite and terminate about 0.8 mm. from the apex of the elytra; seventh and eighth striae confluent, terminating 1.0 mm. from the apex of the elytra. *Abdomen:* Sparsely granulate; combined length of the first and second visible sternites equal to the distance between the middle and hind coxae; hind sternite, at the middle, twice as long as the fourth visible sternite. *Legs:* Long, slender; middle and hind femora convex outwardly, concave inwardly; first segment of hind tarsus as long as the second, third, and fourth combined; second segment as long as the third, fourth, and fifth combined. Length: 4.2 mm., breadth: 2.0 mm.

Allotype: Distance between the eyes slightly greater than the combined width of the eyes; antenna similar to the holotype but shorter; prominent tubercles near the hind margin of the apical sternite. Length: 6.0 mm.; breadth: 2.7 mm.

Type locality: Oahu, Puu Palikea, Waianae Mountains, 1800 feet.

Holotype male and allotype deposited in the Bernice P. Bishop Museum.

The author, while collecting living stems of *Chenopodium oahuense* for breeding an endemic cerambycid, noticed the recent exit holes in some dead, dry stems. Two sections of the latter material about 1 foot long and 2 inches in diameter were also collected. The two specimens issued on April 18 and 24, 1953.

This species is very similar to *X. gossypii,* but it is more elongate, the pronotum is differently formed, and the eyes are wider than *gossypii. X. chenopodii* is extremely rare, as the host plant is common only in a few large stands, and suitable material for *chenopodii* is rapidly being destroyed by climatic conditions and other insects, to say nothing of heavy parasitism which seems to affect most of the species of *Xyletobius.*

Xyletobius bidensicola, new species

Male: Robust, with aenescent, tangential tomentum. *Antenna:* Moderately long; the two basal segments testaceous; remaining segments piceous; fourth segment nearly as broad as long; ninth and tenth segments equal in length; terminal segment twice as long as the fifth; one or two long setae on the inner angle of the first, second, and third segments. *Head:* Dark fuscous, with large granules partly obscured by coarse tomentum; distance between the eyes three and one-half times as wide as an eye; eyes of moderate size, without setae; maxillary and labial palpi testaceous; terminal segment of maxillary palpi feebly emarginate, the outer angle slightly acute, but not protruding; mandibular teeth glabrous and piceous, the inner tooth slightly shorter than the outer. *Thorax:* Light fuscous, feebly bituberculate, finely punctate on the center of the disc, punctuations obscured laterally by large granules; anterior margin hardly raised; moderately explanate laterally; posterior margin partly hidden by overlapping humeri when seen dorsally; the front angles slightly acute; beneath covered with sparse, uniform, cinereous tomentum and large granules. *Elytra:* Dark fuscous; striae sinuate, deep, impunctate; fourth and fifth striae confluent, shorter than all the others except the first which extends but little past the scutellum; aeneous tomentum may reflect purplish or pink; tangential arrangement producing spots of various magnitudes and contours, this depending upon the position of the insect and the light reflected therefrom. *Abdomen:* Piceous, swollen, granulate; tomentum pale yellow, uniform, less dense than on the dorsum; hindmost visible sternite as long as the combined length of the third and fourth visible sternites at the middle. *Legs:* Yellow; finely, sparsely tomentose; first tarsal segment of hind leg as long as the remaining segments combined. Length: 3.5 mm.; breadth: 1.8 mm.

Allotype: A horizontal, linear depression near the posterior margin of the apical sternite; antennae slightly shorter; otherwise identical to the holotype. Length: 3.8 mm.; breadth: 1.9 mm.

Paratypes: 14 paratypes measuring 3-4 mm.

Type locality: Oahu, leeward side of Mt. Kaala, Waianae Mountains, 2800 feet.

Holotype male and allotype in the Bernice P. Bishop Museum, 2 paratypes in the British Museum (Natural History), and 12 paratypes in the collection of the author.

A series of 16 specimens was bred from a native *Bidens* collected by the author on the leeward side of Mt. Kaala in April, 1952, and a single specimen from the same plant several miles south of Mt. Kaala on the windward side of the Waianae Mountains.

X. bidensicola may be placed in group (4a) of Dr. Perkins' key, or grouping, of the species (F.H. 3, p. 586). This species is similar to *X. euphorbiae* Perkins, but not easily confused with it. Although *X. euphorbiae* is similar in size and general appearance, a closer examination will reveal a less transverse pronotum, shorter antennae, the tomentum consisting of an admixture of light fuscous and cinereous with pinkish reflections. Furthermore, the elytral striae are deeper, more sinuate, the seventh and eighth striae confluent apically. *X. cyphus* Perkins probably is similar also. This species was described from a single mutilated example (F.H. 3, p. 606). According to Dr. Perkins' description, *cyphus* differs to a greater extent from *bidensicola* than from *euphorbiae.*

Host Plants of the Oahu Species of Xyletobius

On Oahu *Xyletobius* is found most numerous in the dry forest areas of the Waianae and Koolau Mountains. Since suitable host material for this genus must be dry, or nearly so, and free of fungi, it would seem that the amount of rainfall is an important factor controlling the population of the species. As in other large genera of endemic Hawaiian Coleoptera such as *Plagithmysus* and *Proterhinus,* the species of *Xyletobius* may be host specific, breed on a group of related plants, or inhabit a number of unrelated plants. The list below includes all collections of *Xyletobius* on Oahu with host records that indicated the species had been bred from the plants cited by the collector. Single species taken from a plant cannot establish without doubt the host of the species, as these insects, being nocturnal, may be taken during the daytime concealed on a variety of plants. However, a series of several specimens taken from a single host species, or single species taken repeatedly from a plant species, indicate with little doubt the host of the species concerned. The host plants of only 14 of the Oahu species are known.

walsinghamii Perkins

Oahu, 1896, guava, Perkins; Mt. Tantalus, November, 1918, *Eucalyptus,* O. H. Swezey; Mt. Tantalus, September, 1919, *Platydesma,* J. C. Bridwell; Haleauau Valley, May, 1926, *Pipturus,* O. H. Swezey; Haleauau Valley, December, 1928, *Broussaisia,* O. H. Swezey; Mt. Kaala, April, 1938, *Pipturus,* E. C. Zimmerman; Pali, December, 1952, *Urera sandwicenseum,* E. J. Ford; Haleauau Valley, March, 1953, *Pipturus,* E. J. Ford.

proteus Perkins

Mt. Kaala, March, 1938, *Gouldia,* E. C. Zimmerman.

marmoratus Sharp

Waianae Mountains, March, 1953, *Sut'on'a,* E. J. Ford.

ashmeadi Perkins
Haleauau Valley, April, 1935, *Antidesma,* O. H. Swezey; Makua, January, 1938, *Coprosma,* E. C. Zimmerman; Mt. Kaala, April, 1938, *Smilax,* E. C. Zimmerman.

beddardi Perkins
Mt. Kaala, April, 1938, *Gouldia,* E. C. Zimmerman.

forelli Perkins
Waianae Mountains, December, 1952, *Euphorbia hillebrandtii,* E. J. Ford.

sharpi Perkins
Mt. Kaala, April, 1952, *Pelea clusiaefolia,* E. J. Ford.

roridus Perkins
Waianae Mountains, April, 1952, *Euphorbia hillebrandtii,* E. J. Ford; Haleauau Valley, February, 1953, *Euphorbia hillebrandtii,* E. J. Ford.

sykesii Perkins
Palikea, February, 1935, *Xanthoxylum,* O. H. Swezey; Kaluanui, February, 1931, *Xanthoxylum,* O. H. Swezey.

timberlakei Perkins
Marsh Trail, December, 1933, *Straussia mariniana,* O. H. Swezey; Waimano Trail, March, 1953, *Straussia mariniana,* E. J. Ford.

aleuritis Perkins
Waianae Mountains, 1892, *Aleurites moluccana,* R. C. L. Perkins; Makaleha Valley, February, 1931, *Aleuritis moluccana,* O. H. Swezey; Mt. Kaala, October, 1944, *Pipturus,* O. H. Swezey; Makaha Valley, September, 1951, *Aleurites moluccana,* E. J. Ford; Puu Kawiwi, July, 1953, *Bidens,* E. J. Ford.

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